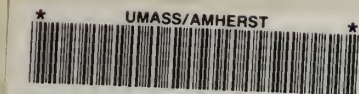


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HIGHWAY PLANNING PROGRAM

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HPR-PL 1 (13)

PART 1

HIGHWAY PLANNING

COMMONWEALTH OF MASSACHUSETTS
DEPARTMENT OF PUBLIC WORKS

785/62

1978 HIGHWAY PLANNING PROGRAM

HPR-PL-1 (13), PART 1

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS
BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

100 NASHUA STREET

BOSTON, MASSACHUSETTS 02114

JANUARY 1, 1978

CALENDAR YEAR 1978
MASSACHUSETTS HIGHWAY PLANNING PROGRAM
HPR-PL-1(13), PART 1

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BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT BUDGET SUMMARY TABLE

Project No.	Project Title	1977 Est. PL Cost (\$)	1977 Approx. PL Exp. (\$)	1977 Est. HPR Cost (\$)	1977 Approx. HPR Exp. (\$)	1977 Tot. Exp. (\$)	1978 Est. PL Cost (\$)	1978 Est. HPR Cost (\$)	1978 Est. Tot. Cost (\$)
1-0	<u>PLANNING ADMINISTRATION</u>	-	-	321,310	320,000	320,000	-	325,000	325,000
1-0	TOTAL			321,310	320,000	320,000		325,000	325,000
2-0	<u>HIGHWAY DATA COLLECTION & PLAN. SERVICES</u>								
2-1	Inventory and Statistics	-	-	168,000	160,000	160,000	-	152,000	152,000
2-2	Traffic Volume Counting	-	-	620,000	640,000	640,000	-	(1) 480,000	480,000
2-3	Highway Functional Classification	-	-	32,000	37,000	37,000	-	35,000	35,000
2-4	Highway Needs Identification	-	-	60,000	53,000	53,000	-	51,000	51,000
2-5	Mapping	-	-	48,000	44,000	44,000	-	65,000	65,000
2-6	Vehicle Weight Study	-	-	(2)	0	0	-	20,000	20,000
2-7	Defense Routes Bridge Record	-	-	2,000	2,800	2,800	-	5,000	5,000
2-0	TOTAL			930,000	936,800	936,800		808,000	808,000
3-0	<u>DATA ANALYSIS AND COMPUTER SERVICES</u>								
3-1	Census Data Development	-	-	55,880	50,000	50,000	-	35,000	35,000
3-2	Data File Management and Display	-	-				-	60,000	60,000
3-3	Traffic Analysis and Forecasting	-	-	41,910	36,000	36,000	-	(3) 50,000	50,000
3-4	Motor Vehicle & Fiscal Data Reporting	-	-	34,925	30,000	30,000	-	50,000	50,000
3-5	Regional Data & Modelling Assistance	-	-	25,000	26,000	26,000	(4)	50,000	50,000
3-6	Statewide Modelling & Planning Applications	-	-	160,000	160,000	160,000	-	135,000	135,000
3-7	Eastern Massachusetts Transportation Studies	-	-	75,000	1,000	1,000	-	75,000	75,000
3-0	TOTAL			392,715	303,000	303,000		455,000	455,000

Project No.	Project Title	1977 Est. PL Cost (\$)	1977 Approx. PL Exp. (\$)	1977 Est. HPR Cost (\$)	1977 Approx. HPR Exp. (\$)	1977 Tot. Exp. (\$)	1978 Est. PL Cost (\$)	1978 Est. HPR Cost (\$)	1978 Est. Tot. Cost (\$)
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4-0 REGIONAL TRANSPORTATION PLANNING

LIAISON ACTIVITIES

4-1	Berkshire County Region	65,000	50,000	34,000	30,000	80,000	66,000	34,500	100,500
4-2	Franklin County Region	-	-	64,000	58,000	58,000	-	58,900	58,900
4-3	Lower Pioneer Valley Region	122,250	110,000	29,000	25,000	135,000	147,000	30,600	177,600
4-4	Montachusett Region	80,000	130,000	34,000	34,000	164,000	97,000	22,000	119,000
4-5	Central Massachusetts Region	130,000	90,000	24,000	24,000	114,000	150,500	22,000	172,500
4-6	Northern Middlesex Region	75,000	85,000	19,000	19,000	104,000	98,000	30,500	128,500
4-7	Merrimack Valley Region	80,000	66,000	24,000	25,000	91,000	89,000	27,400	116,400
4-8	Metropolitan Boston Region	519,000	610,000	47,000	40,000	650,000	613,000	40,500	653,500
4-9	Old Colony Region	75,000	125,000	19,000	19,000	144,000	89,000	20,400	109,400
4-10	Southeastern Mass. Region	103,750	130,000	27,000	25,000	155,000	127,000	33,300	160,300
4-11	Barnstable County Region	-	-	47,000	45,000	45,000	-	52,100	52,100
4-12	Martha's Vineyard Region	-	-	17,000	1,000	1,000	-	3,500	3,500
4-13	Nantucket County Region	-	-	17,000	14,000	14,000	-	17,400	17,400
4-14	Berkshire Co. Regional Plan. Study	150,000	100,000	-	-	100,000	136,000	-	136,000
4-0	TOTAL	1,400,000	1,496,000	402,000	359,000	1,855,000	1,612,500	393,100	2,005,600

5-0 PROGRAM DEVELOPMENT

5-1	Transportation Plan. Coordination	-	-	172,865	172,000	172,000	-	30,000	30,000
5-2	Regional and Statewide Trans. Plan Development	-	-	-	-	-	-	88,000	88,000
5-0	TOTAL	-	-	172,865	172,000	172,000	-	118,000	118,000

6-0 CAPITAL EXPENDITURE AND PROJECT PROGRAMMING (5)

6-0	TOTAL	-	-	-	-	240,000	-	-	260,000
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GRAND TOTAL

		1,400,000	1,496,000	2,218,890	2,090,800	3,826,800	1,612,500	2,099,100	3,971,600
--	--	-----------	-----------	-----------	-----------	-----------	-----------	-----------	-----------

- (1) Does not include estimated PE charges of \$130,000
- (2) No Vehicle Weight Study was performed in 1977
- (3) Does not include estimated PE charges of \$15,000
- (4) \$100,000 of PL funding for this project is included in 4-0
- (5) This activity is not programmed for Federal participation

INTRODUCTION

The primary objective of this work program is to describe the proposed activities of the Bureau of Transportation Planning and Development for calendar year 1978. In addition, this document:

1. Describes the BTP&D accomplishments during 1977.
2. Identifies the major BTP&D goals for 1978.
3. Serves as a management tool which relates the latest BTP&D Five-Year Unified Transportation Work Program to the HPR work to be performed during 1978. As such, it is the basis for allocating anticipated 1978 resources to BTP&D units and the regional planning agencies (RPA's).
4. Serves as the coordinating mechanism through which various transportation planning functions are integrated with other activities of the Mass. Department of Public Works, the Executive Office of Transportation and Construction, the Office of State Planning, other State and Federal agencies, and the RPA's.
5. Serves as the basis for applying for Federal planning funds from the U. S. Department of Transportation.
6. Serves as the budgetary document for carrying out the Systems Planning functions of the Massachusetts Action Plan.

It should be noted that the Unified Transportation Work Programs developed and adopted in each of the Commonwealth's thirteen planning regions are considered to be integral parts of the BTP&D's overall program.

A description of the regional transportation planning process is contained under Regional and Urban Transportation Planning (IV).

Procedures Used to Develop the 1978 HPR-PL Work Program

The supervisors responsible for the individual study elements for 1977 have reviewed the objectives, the procedures, the products, the participants, the cost, the schedule, and the need for the work program elements. On the basis of the comments prepared by the reviewers, the 1978 Highway Planning Work Program was developed and submitted for A-95 and FHWA reviews. On the basis of comments received, the draft version was modified for submittal to the FHWA.

A complete description of the 1978 Highway Planning Program elements would include task sheets from the BTP&D Five-Year Work Program which outlines BTP&D activities through 1980 and details the work to be done under each HPR Highway Planning Program element. However, in order to conserve paper, those task sheets are omitted. Both the one-year and five-year documents will continue to be revised as various tasks are implemented. Each must be viewed as a dynamic document, subject to change by the BTP&D as necessary to reflect progress and experience.

The format for the 1978 Highway Planning Program has been revised; all program activities are now grouped on a functional basis to provide a convenient overview of BTP&D's transportation planning process. The successful implementation of any work program is dependent upon the availability of an adequate number of trained personnel sufficiently equipped to perform the required tasks. Achievement of the goals of this work program likewise depends upon these key factors. The forecasts of available manpower in earlier Highway Planning Programs often proved too optimistic.

This 1978 Highway Planning Program is based on realistic estimates of personnel resources.

The budget, as submitted, represents an initial judgement of the most effective distribution of available monies. Based on past experience, it may be necessary to occasionally redistribute funds among certain study items. The Budget Summary Table provides a complete comparison of proposed funding levels with those of the previous year.

In addition to the HPR funds, PL funds (sometimes referred to as Section 112 funds) are allocated to the RPA's for the nine regions which contain urbanized areas in accordance with the 1973 Federal-Aid Highway Act.

As noted, it may be necessary to reallocate funds from one element of the Highway Planning Program to another, if priorities change during the course of the year.

Functions of the Bureau of Transportation Planning and Development

The Bureau of Transportation Planning and Development, Massachusetts Department of Public Works, was established in 1964 under Section 3A of Chapter 16 of the General Laws. The executive and administrative head of the Bureau is the Director of Transportation Planning and Development.

The Bureau serves as the principal source of transportation planning in the Commonwealth and conducts research, surveys, demonstration projects and studies in cooperation with the Federal Government, other public agencies especially the Regional Planning

Agencies, and is responsible for the continual preparation of comprehensive and coordinated transportation plans and programs. The statute requires that these multi-modal transportation plans be consistent with comprehensive development plans. In addition, the Bureau maintains a wide variety of transportation information and statistics for use by other agencies, municipalities, and the private sector. Figure 1 illustrates the relationship of the BTP&D to the other units within the Department of Public Works. Figure 2 shows the internal organization of the BTP&D.

Overall Goals of the BTP&D

In accordance with the legislative mandate given to the BTP&D by the state legislature in 1964, the overall goal of the BTP&D is to serve as the "... principal source of transportation planning in the Commonwealth." It is the intent of the Bureau to provide the data and information necessary to identify and analyze transportation opportunities, problems and issues in the context of comprehensive growth and development policies and plans; to develop alternative solutions; to evaluate the impacts of all alternatives on an inter-disciplinary basis; and to recommend plans, priorities and programs to those responsible by law for making final transportation decisions. In this way, transportation decision makers will benefit from a better knowledge of the impacts of such decisions on the transportation system as well as on the other elements of comprehensive state, regional and local plans and programs.

The work carried out by the BTP&D will be accomplished cooperatively with local, regional, State, and Federal agencies and with

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

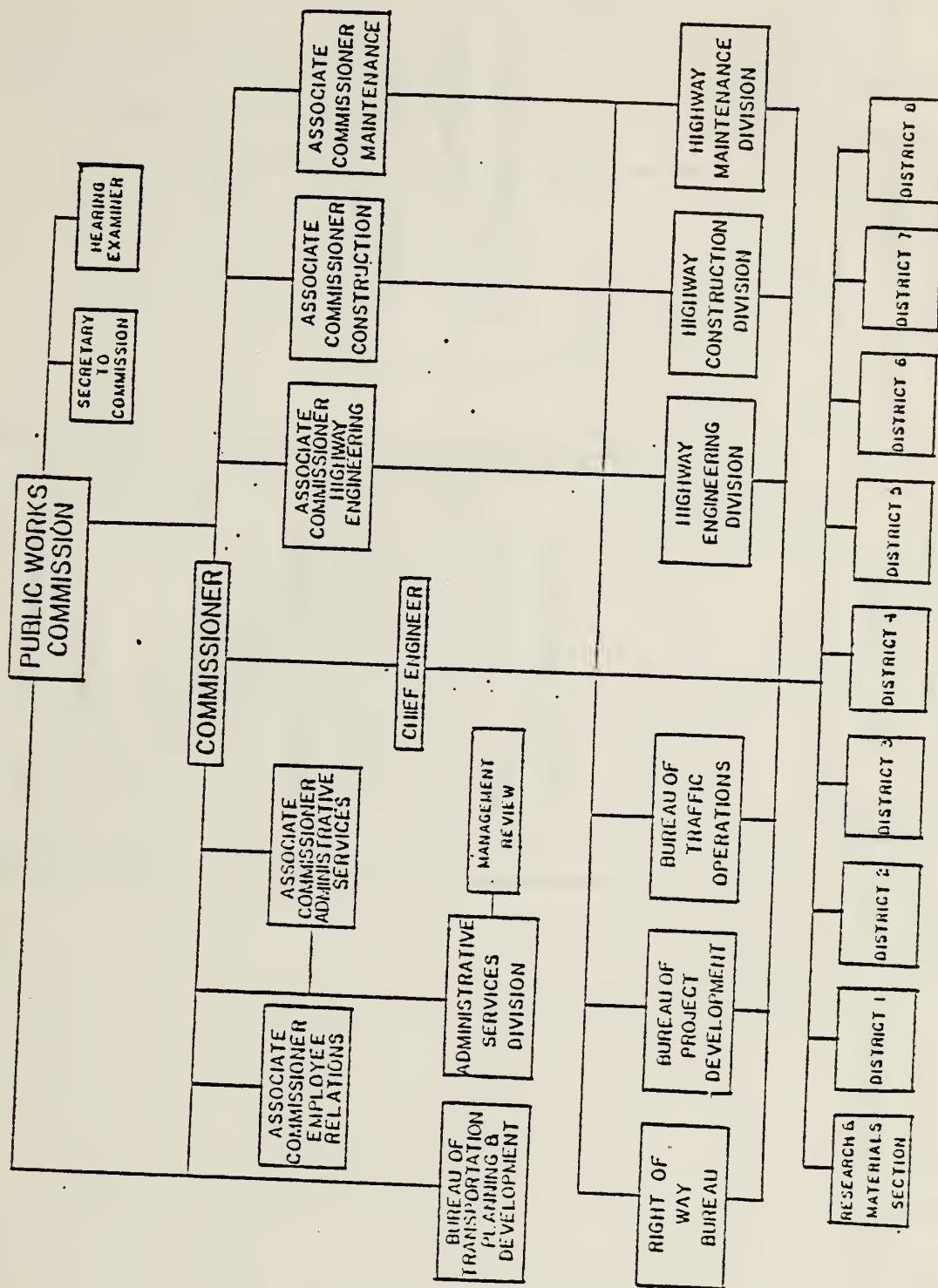


FIGURE 1

MASSACHUSETTS DEPARTMENT OF PUBLIC WORKS

BUREAU OF TRANSPORTATION PLANNING AND DEVELOPMENT

150 CAUSEWAY STREET, BOSTON, MASSACHUSETTS 02114

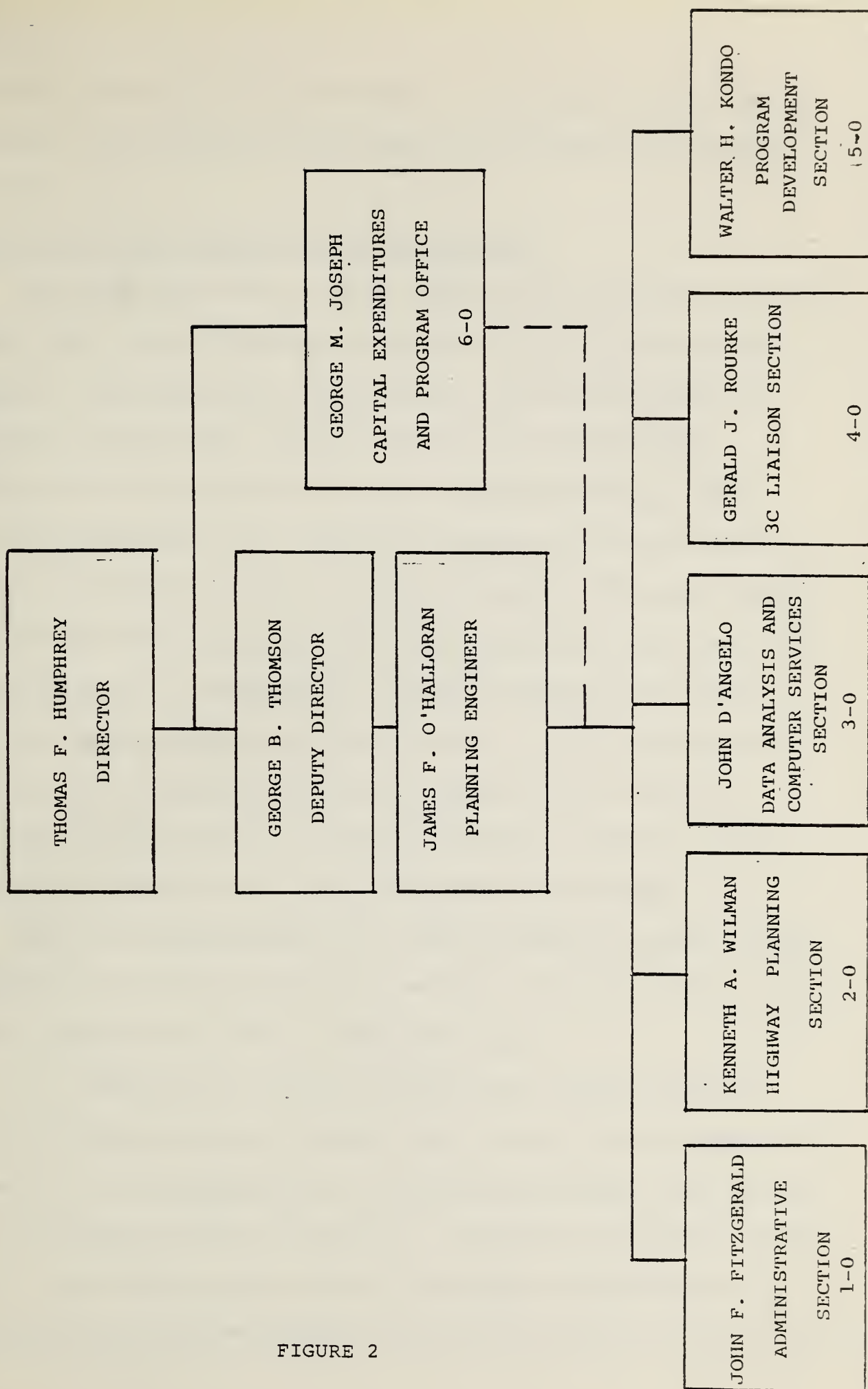


FIGURE 2

citizens and special interest groups in the spirit of the comprehensive, cooperative and continuing (3C) transportation planning process.

Major 1977 BTP&D Objectives and Achievements

The major objectives of 1977 involved the continued training of BTP&D, RPA, and DPW District planning personnel, the improvement of technical planning tools and procedures, and the development of relevant planning data, analyses and reports necessary for enlightened transportation investment decision-making. These objectives were part of a continuing update of detailed overall BTP&D goals first enunciated in the 1973 Highway Planning Program. Gradually, BTP&D's goals of achieving overall technical excellence in carrying out a statewide and regional transportation planning and programming process are being realized. This is being accomplished in an open and participatory manner, with increasing reliance upon the technical staffs of regional planning agencies to carry out detailed analyses of transportation issues.

The 1977 accomplishments for various Highway Planning Program elements are listed in subsequent sections. The major achievements of the BTP&D during 1977 are summarized below:

1. Metropolitan Planning Organizations and the Regional 3C Transportation Planning Process (4-0). Recent Federal regulations required the establishment of a Metropolitan Planning Organization in each urbanized area of the state. Agreement was reached during 1976 on the makeup of the MPO, and the BTP&D's 3C Transportation Planning Process was modified to provide for the new organization. The

MPO, which includes the Executive Office of Transportation and Construction, the Department of Public Works, the Regional Planning Agency and Regional Transit Authority (where applicable), is now an effective participant in the 3C Transportation Planning Process.

2. "Masspool" Carpool/Vanpool Program (4-0)

During the year, BTP&D has taken over the "Masspool" Carpool/Vanpool program that was initiated by a consultant.

BTP&D personnel travel throughout the state to explain prospective benefits of the program to employers and employees, and to provide technical assistance in setting up local carpool/vanpool programs.

3. Statewide Program of Projects to be Advertized (6-0)

The Statewide "Program of Projects to be Advertised" was produced, listing all projects scheduled for advertizing from January 1, 1977 to December 30, 1978.

4. Statewide '105' Federal-Aid Program (6-0)

The Annual '105' Program of Federal-Aid Projects for 1977 was developed and submitted to the FHWA. The '105' Program lists all Federal-aid projects for which funds are expected to be obligated.

5. Project Information System (6-0)

BTP&D's computerized Project Information System has been refined to the point where a broad range of data can be provided for all 1200 active MDPW projects, with the exception of some State-aid, Maintenance and other small-scale projects usually handled at the District offices. Project data can be aggregated in a variety of formats and includes a Project description, location, route number,

cost estimate, and where applicable, TIP status, Development/Design status, project expeditors, scheduling and funding status and environmental data.

6. Development of Regional Transportation Plans (4-0, 5-0)

Transportation Plans are being developed by the RPA's in accordance with Federal certification requirements. BTP&D provides a wide variety of technical assistance toward development of regional transportation plans. Those plans utilize products of the regional '208' and HUD planning programs and also incorporate local Growth Policy statements.

7. The Action Plan (1-0, 4-0)

A substantial revision of the Mass. Action Plan was initiated during the year; this effort involves completely rewriting the document in an effort to greatly simplify it for easier understanding and usefulness by the general public.

8. Statewide Model and Network (3-6)

Initial coding and first-pass plot edits have been completed for the entire Statewide network, and data and logic debugging is underway.

9. Highway Functional Classification (2-3)

Since the realignment of all Federal-aid Systems to Highway Functional Classification last year, the systems have been updated to reflect changes requested by the cities and towns.

Highway Functional Classification, Federal-Aid Primary, Secondary and Urban Systems maps were updated to reflect these changes and were distributed in-house, to other agencies and to local communities.

10. Technical Assistance and Training (All sections)

BTP&D units provide a wide variety of technical assistance and training to the RPA's in support of 3C Transportation Planning activities.

Training is provided primarily in the area of computer applications and processing to increase the technical capability of RPA personnel to create models, networks and programs for data analysis and travel forecasting.

11. Technical Guidelines (5-0)

Technical guidelines for the conduct of Corridor Planning Studies and A-95 reviews were completed, reviewed and adopted; guidelines for conducting Regionwide Comprehensive Transportation Planning Studies are under development.

12. Rural Highway Public Transportation-Demonstration Programs (5-0)

Bus service is being provided under Demonstration programs in both Barnstable and Franklin Counties; The programs were developed jointly by BTP&D and the counties, with Federal funding.

13. Bikeways (5-0)

Development of the Bikeways program shows continued progress. Funding priorities for the \$2M Mass. Bikeway Bond Issue were set, bikeway projects were processed for implementation and liaison on bikeways was provided to agencies, organizations and local communities.

14. Corridor Planning Studies (CPS) (4-0, 5-0)

BTP&D has developed a quarterly Corridor Planning Study Status Report to provide a centralized source for current information on the

numerous CPS's underway throughout the Commonwealth. The Report includes a progress rating for each RPA in the development of traffic forecasting capability.

The CPS Status Report is distributed in-house and among other agencies including all RPA's.

15. Regionwide Comprehensive Transportation Planning Studies
(1-0, 3-0, 4-0, 5-0)

Progress continues on the Regionwide Comprehensive Transportation Planning Studies underway in the Montachusett and Berkshire regions; both of these studies may be completed during 1978.

16. Educational Achievements (5-0)

BTP&D has sponsored or participated in a variety of seminars, conferences and courses during the year to help improve the technical capability of BTP&D and RPA personnel to undertake the growing range of transportation planning concerns and responsibilities. These include:

U. S. DOT, Basic Techniques in Urban Transportation
Planning, Washington, D.C.

U. S. DOT, Advanced Techniques in Urban Transportation
Planning, Washington, D.C.

U. S. DOT, Alternatives for Improving Urban Transportation,
Providence, R.I.

FHWA - Highway Statistics as Planning Tool, Washington D.C.

FHWA - Short Course in Urban Transportation Planning
Boston, Mass.

FHWA, Highway Engineering Economics, Concord, Mass.

MIT, Transportation Systems Analysis, Cambridge, Mass.

FHWA, Social and Economic Consideration in Highway Planning
and Design, Concord, N.H.

Transportation Research Board, 55th Annual Meeting,
Washington, D.C.

North Atlantic Highway Planning Officials, Albany, N.Y.

National Transportation Week Conference, Boston, Mass

Census Data Use Workshop, Brockton, Mass.

Monthly Informational Meeting, DPW and RPA's, Boston, Mass.

Tri-State Transportation Coordinating Committee, Concord Ma.

Intermodal Planning Group, Seminar on Integration of
Planning, Boston, Mass.

U. S. Bureau of Census, Summary Tape Conferences,
Washington, D.C.

Boston Transportation Group, Boston, Mass.

Transportation Research Forum Meetings, Boston, Mass.

MIT Transportation Center Meetings, Cambridge, Mass.

U. S. DOT Symposium on Behavioral Travel Demand Model
Estimation Procedures, Washington, D.C.

FHWA, Statewide Highway Systems Planning, Concord, N.H.

AASHTO, Annual Meeting, St. Louis, Mo.

ASCE, AIP, Human Implications of Massachusetts Growth
Policy, Boston, Mass

Boston Harbor, Harbor Development Assoc. Workshops, Boston, Ma.

Univ. of Lowell, Fifth Annual Business & Economics Develop-
ment Conference.

17. National Highway Inventory and Performance Study (2-4)

This study, involving the completion of approximately four thousand worksheets, was completed and submitted to the FHWA. A study report is being prepared.

18. Statistical Reporting for the FHWA, (3-4)

Improved data gathering and reporting procedures developed by BTP&D have appreciably shortened the compilation time for the statistical data required by the FHWA.

19. The Interim Comprehensive Transportation Plan (5-2)

A statewide multi-modal Interim Comprehensive Transportation Plan is currently under compilation by BTP&D. It utilizes the products of BTP&D's 3C Transportation Planning Process and will provide an overview of transportation plans, programs and objectives for a ten year period.

Major 1978 BTP&D Objectives:

The overall 1978 BTP&D objectives which have shaped the elements of this Highway Planning Program include:

1. Completion of the draft statewide Multi-Modal Interim Comprehensive Transportation Plan (5-2): All of the necessary activities to achieve this objective are currently underway.

2. National Highway Inventory and Performance Study (NHIPS) (2 -4): A study report will be published and the NHIPS data file will be refined to facilitate highway improvement priority-setting based on deficiency analysis and needs identification and will provide an appraisal of structural, safety and service performance on the realigned Federal-aid Primary and Secondary Systems.

3. Development of Regional Computer Models and Networks (3-5):

Continued progress is anticipated in the objective to make each RPA self-sufficient in developing and running regional transportation models and networks. This objective represents a considerable commitment by BTP&D in training and technical assistance provided to the RPA's; eight RPA's now have the capability to utilize the MDPW District Computer Terminal Network and Boston computer.

4. Development of a Statewide Computer Network (3-6):

The initial edit will be completed for most data fields in the continuing development of the statewide network. Additional fields will be calculated or coded to improve the versatility of the system.

Data developed and provided by the RPA's will be aggregated into statewide Analysis Zones.

5. Development and Refinement of BTP&D Guidelines (1-0, 5-0):

The Development of new BTP&D technical and administrative guidelines, and the refinement of existing guidelines will continue. A 1978 objective is the completion and review of the Regionwide Comprehensive Transportation Planning Studies Guidelines.

6. The Revised Action Plan (1-0, 4-0):

A 1978 objective is to complete the rewriting of the Mass. Action Plan. This substantial revision is currently underway in a joint effort by BTP&D, the Bureau of Project Development and the Procedures and Records Section, and should be ready for FHWA review during 1978.

7, BTP&D 5-Year Work Program: 1979 through 1983 (1-0):

The original BTP&D 5-Year Work Program was developed for the years 1974 through 1978, and was intended to provide the framework for BTP&D activities and for RPA Work Programs during that period. Most of the objectives contained in that document and in subsequent revisions will be substantially achieved.

A major BTP&D objective will be the development of a new BTP&D 5-Year Work Program for the years 1979 through 1983 to indicate new BTP&D priorities and to outline planning goals for the coming five year period

1-0 - PLANNING ADMINISTRATION

Management

BTP&D Director:	T. F. Humphrey
BTP&D Deputy Director:	G. B. Thomson
Planning Engineer:	J. O'Halloran

Staff Responsibility

Administration Section:	Supervisor,	J. Fitzgerald
Administrative Unit	Manager,	A. Kearney
Budget Development Unit	Manager,	A. Scialabba, Jr.
Contract Payment Unit	Manager,	R. St. Laurent

Project Goal

The project goal is to administer all BTP&D operations including this 1978 Highway Planning Program, and to provide all secretarial and clerical services, duplicating, equipment and supplies for planning activities. These costs cannot be charged to specific Highway Planning Program projects without unreasonable cost accounting.

In addition, the annual BTP&D budget is compiled, and all expenditures for contract payments, equipment and repairs are monitored and processed.

Numerous reports are compiled for the FHWA and other agencies and associations, and various special projects are undertaken and coordinated.

1978 Objectives

The appropriate ongoing administrative services outlined above will continue to be provided. In addition:

- o The new BTP&D 5-year Work Program will be developed to define BTP&D goals and priorities for the years 1979 through 1983.
- o A new monthly computerized expenditure report will be distributed, showing all expenditures for each BTP&D activity, consistent with

the new functional Highway Planning Program format.

<u>Costs (\$)</u>		1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a)	Force Account	321,310	320,000	325,000
b)	Contract	<u>0</u>	<u>0</u>	<u>0</u>
	TOTAL	321,310	320,000	325,000

2-0 - HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-1 Inventory and Statistics

Staff Responsibility

Inventory and Statistics Unit:

Supervisor: K. Wilman

Manager: P. Hughes

Project Goal

The goal of the road inventory program is the formation and maintenance of a continuously updated comprehensive data file for short- and long-range transportation planning activities. This is achieved through the collection, analysis and computerization of highway and highway-related data. A current detailed road inventory is required for both the proper assessment of present needs and the reliable forecasting of future needs, to insure the orderly development of highway systems policies and programs. Other uses of the data include input to State and National Transportation studies, computer network modelling, highway capacity analyses, statistical reporting, state-aid, safety and maintenance programs, cost estimating, highway functional classification, Federal-aid system revisions, mapping, and highway-bridge, railroad, bus and airport studies.

To ensure that data is kept current, contact is maintained with each of the 351 cities and towns in the Commonwealth through the District Planning Engineers in the Department's eight District Offices.

The major product of the road inventory program's computerized data file is a series of computer printouts showing the origin, termination, length, and administrative and geometric data for the approximately 33,000 miles of road open to public travel in the

Commonwealth. Other printouts show geometrics for all highway bridges, and the physical condition and other relevant data for highway/railroad grade crossings.

The computer programs developed to utilize road inventory data are being continually refined. File data is available in a variety of formats to meet the highway statistics reporting needs of the Department, including administrative, Federal-aid and functional systems categories, and local road mileage statistics, used as one factor in the allocation of State-aid funds to local communities.

1977 Accomplishments

Accomplishments for the year include:

- o The distribution of a printout, to each city and town in the Commonwealth for verification, showing the name, origin and termination, administrative system and total length, for each street in the community.
- o The completion and submission of the calendar year 1976 Mileage Facilities PR500 series of forms to the Federal Highway Administration (FHWA).
- o 85% completion of the color-coded 2000 scale (1000 scale within Federal-aid urban boundaries) identification map series.
- o The examination and recoding of the data fields containing Federal-aid system, route number and functional classification data in order to reflect the 1976 realignment of Federal-aid systems.
- o Developing and initiating procedures for the utilization of the District Offices and local communities to update inventory file data and the Lockwood, Kessler and Bartlett (LKB) regional map series.

- o Supplying information upon request to other MDPW units, Federal and State Agencies, cities and towns, businesses and individuals.
- o Assisting the Data Analysis and Computer Services Section in developing procedures to retrieve Road Inventory data in a format suitable for Mileage Facilities reporting to the FHWA.

1978 Objectives

The ongoing services outlined above will be continued, and:

- o A new edition of the road inventory manual including procedures, coding and typical data file output will be published.
- o An inventory of all ramps at freeway and expressway system interchanges will be initiated.
- o The recently established annual road inventory update procedure outlined above will be fully implemented. Current computer printouts will be distributed to all District Offices and local communities for their use, and for their review, update and return of the data to BTP&D in the Fall of the year for updating the road inventory file. Current printouts will be distributed again the following January, and the annual process will be repeated.
- o The Mileage Statistics report required annually by the FHWA will be compiled and distributed.
- o The traffic volume data in the file will be updated to provide a common base and enable Vehicle-Miles of Travel printouts by Federal-aid, functional classification and administrative systems.

- o The 2000 scale color-coded identification maps (1000 scale within the Federal-aid Urban boundaries) will be completed.
- o The PR529 Form and the PR 502 Series will be completed by hand and submitted with the computerized Mileage Facilities Report prepared for the FHWA by the Data Analysis and Computer Services Section.

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	168,000	160,000	152,000
b) Contract	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	168,000	160,000	152,000

2-0 HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-2 Traffic Volume Counting (formerly 4-1)

Staff Responsibility

Traffic Counting Unit:	Supervisor:	K. A. Wilman
	Manager:	A. D. Batchelder

Project Goal:

The Goal is to obtain traffic volume data at minimal cost as a quantitative measure of highway usage. Information derived from this activity has numerous uses in both the public and private sectors.

Traffic volume data is a basic planning tool, essential for identifying current needs, and forecasting future needs, for the planning, design and maintenance of transportation facilities. It provides an indication of growth trends and aids in the functional classification of highways.

1977 Accomplishments

- o The following traffic volume counts were taken:
 - Twenty-five permanent stations were operated by personnel from the Wellesley Shop, with weekly inspection assistance from district crews;
 - One hundred and twelve control stations were operated by the district crews with assistance from Wellesley Shop personnel;
 - Nine hundred 48-hour coverage stations were covered by district personnel;
 - Approximately six hundred special counts were taken by Wellesley Shop personnel at the request of various DPW sections and other agencies.

- o 240 ADT counts were taken for the annual update of the FHWA Interstate System Traveled-Way Traffic Map.
- o BTP&D assisted in Consultant Study of Route 1 North (Saugus) by providing traffic counts at twenty-five locations.
- o Thirteen traffic sensor loops were installed at various locations throughout the State by Force Account, and nine were installed under contract.
- o The 1975 Traffic Volume Report was completed and distributed.
- o The 1976 Traffic Volume Report and Traffic Flow Map was completed and printed.
- o Traffic data and special counts were provided for Planning Studies conducted by various RPA's.
- o Twenty-nine new traffic recorders were purchased this year as a start in our program to replace twenty-five year old equipment.
- o A special traffic study of the Southeast Expressway was conducted in conjunction with the Carpool-Express Bus Lane Project. Vehicle Occupancies, time runs, and main line and ramp counts were taken both manually and by machine at twenty locations.
- o Permanent station data was computerized and transmitted to the FHWA monthly; control station data was processed bi-monthly; coverage and special counts were processed when received.

1978 Objective:

- o Field Operations with permanent, control and coverage stations and special counts will continue.
- o The Traffic Volume Report for 1977 will be published.
- o A complete review of all traffic counting stations will be

made to ascertain the need, expense and acceptable data tolerances.

- o Short counts obtained from the 1976 Traffic Counting Program will be expanded to Average Daily Traffic, adjusted for seasonal factors.
- o In order to continue the present level of service in filling traffic data requests, the following equipment will be provided during 1978 to replace outmoded equipment:

- a) Lease of two Van-type Trucks: \$ 8,000
- b) Purchase of twenty traffic recorders: $\frac{\$20,000}{\$28,000}$

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	585,000	600,000	452,000 (1)
Equipment	35,000	40,000(2)	28,000
b) Contract	$\frac{0}{620,000}$	$\frac{0}{640,000}$	$\frac{0}{480,000}$

(1) Does not include \$130,000 of anticipated charges to PE funds.

(2) Does not include \$10,000 of Accelerated Highway Funds.

2-0 - HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-3 Highway Functional Classification (formerly 7-1)

Staff Responsibility

Classification and Needs Unit:	Supervisor:	K. Wilman
	Manager:	P. Hughes

Project Goal

Highway functional classification is the process by which roads and streets are grouped as components of an integrated highway network, in accordance with the type of service they are intended to provide.

Functional classification is a dynamic process that responds to land use changes and motorists habits, and therefore requires continual review and updating.

1977 Accomplishments

The 1973 Federal-Aid Highway Act required each state to realign its entire Federal-aid system based on highway functional classification by July 1, 1976, thereby creating a new basis for Federal-aid funding for highway projects. With this enormous task completed, the work effort has consisted of making changes to the systems upon request of various communities.

In spite of repeated requests by this unit, two communities out of two hundred and six still have not confirmed their functional classification for urban systems.

All highway functional classification, Federal-aid Primary, Secondary and Urban Systems maps shown on a statewide, regional or local scale, along with descriptive logs for each highway route, have been updated and distributed in-house and to other agencies and local communities.

The Travel and Accidents table (TA-1), which lists highways by Federal-aid and other administrative categories was completed.

In addition, statistics from the following highway categories were updated:

o	F.A. Primary System	-----2811 miles
o	Urban Extension System	-----1524 miles
o	F.A. Secondary System	-----2105 miles
o	Urban Systems	-----5581 miles
o	Communities eligible for Urban System funding	----- 206
o	Communities actually approved for Urban Systems	----- 204

1978 Objectives

This unit will continue to maintain and update all the component parts of the Highway Functional Classification and Federal-aid network, including revisions to urban boundaries, various map series showing functional and Federal-aid Systems, and route logs, and to service requests for data and technical assistance from local, regional and state agencies.

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expend.	1978 Est. HPR
a) Force Account	32,000	37,000	35,000
b) Contract	0	0	0
Total	<u>32,000</u>	<u>37,000</u>	<u>35,000</u>

2-0 - HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-4 Highway Needs Identification (formerly 7-2)

Staff Responsibility

Classification and Needs Unit:	Supervisor:	K. Wilman
	Manager:	P. Hughes

Project Goal

The goal of the Highway Needs Identification program is to develop procedures and a supportive data base for locating and identifying physical deficiencies on our Federal-aid highway network including the Interstate, other primary, secondary and urban systems. This will enable a performance rating for each Federal-aid route to be made, based on Condition, Safety and Service considerations, and will facilitate comparisons among these routes for determining highway improvement priorities based on maximum use benefit per improvement dollar.

The Highway Needs Identification program is divided into two phases:

1. The completion of the National Highway Inventory and Performance Study (NHIPS) and its submission to FHWA.
2. Refinement of the NHIPS data file developed in Phase 1 into a format which will facilitate highway improvement priority-setting based on deficiency analysis and needs identification.

1977 Accomplishments

Accomplishments for the year include:

- o Phase 1 of the NHIPS Study was completed. Approximately four thousand worksheets were completed, at the following sample rates:

<u>RURAL SYSTEMS</u>	MINIMUM <u>% MILEAGE SAMPLE</u>
<u>Principal Arterials</u>	100
Interstate	
Other Principal Arterials	
<u>Minor Arterials</u>	100
<u>Major Collectors</u>	100
<u>Minor Collectors</u>	10

URBAN SYSTEMS

<u>Principal Arterials</u>	
Interstate	100
Urban Ext. of Rural Principal Arterials	100
Urban Ext. of Rural Minor Arterials	100
Other Urban Principals	50
<u>Minor Arterials</u>	25
<u>Collectors</u>	10

- o Following submission of Phase 1, Phase 2 commenced and emphasis shifted from Functional Classification to Federal-aid route systems. The NHIPS data file is being categorized by route; performance rating criteria and individual route maps are being developed.
- o Initiating development of a crosstie between the Road Inventory and NHIPS data files.

1978 Objectives

1978 objectives include:

- o Publication of a NHIPS report, including data reported to the FHWA under Phase 1.

- o Continued work on Phase 2 of the NHIPS study as outlined above.
- o Initiating work for the publication and distribution of the initial results of Phase 2, that will include a schematic map of each Federal-aid Primary and Secondary route with relevant administrative, geometric and physical condition data.
- o Expanding the NHIPS Federal-aid Urban Systems sample to 100%.

<u>Costs (\$)</u>		1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a)	Force Account	60,000	53,000	51,000
b)	Contract	<u>0</u>	<u>0</u>	<u>0</u>
	TOTAL	60,000	53,000	51,000

2-0 - HIGHWAY DATA COLLECTION AND PLANNING SERVICE

2-5 Mapping (formerly 3-1)

Staff Responsibility

Mapping Unit:

Supervisor, K. Wilman

Manager, G. Jenness

Project Goal

The goal is to provide up-to-date general highway series maps showing natural and man-made features for use by both public and private sectors, including the land-use and urban, rural and regional transportation maps necessary for comprehensive urban and regional planning activities.

1977 Accomplishments

During 1977, mapping efforts previously concerned with Federal-aid Route submissions, were directed towards updating the General Highway Regional Series Mylars, and several have been completed.

Inventories of various map series were maintained for agency use and public sale, including both the regional and county series.

Maps were supplied upon request to a variety of public agencies, and were available, at cost, to the general public.

An index of air photographs, available on special order, is also maintained for public use.

Offset printing of the small 1" = 1 mile regional series maps that was proposed for this year has been deferred until a greater number of mylars have been updated.

1978 Objectives

The appropriate ongoing mapping services outlined above will be continued, and the production rate for updating the Regional Series Mylars will be increased.

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	45,000	44,000	65,000 (2)
c) Contract	<u>3,000</u>	<u>0 (1)</u>	<u>0</u>
TOTAL	48,000	44,000	65,000

(1) Proposed offset printing of the 1" = 1 mile Regional Series maps was deferred.

(2) Increase in estimated cost is due to an additional employee assigned to this activity.

2-0 - HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-6 Vehicle Weight Study (formerly 4-3)

Staff Responsibility

Traffic Counting Unit:	Supervisor,	K. Wilman
	Manager,	D. Massucco

Project Goal

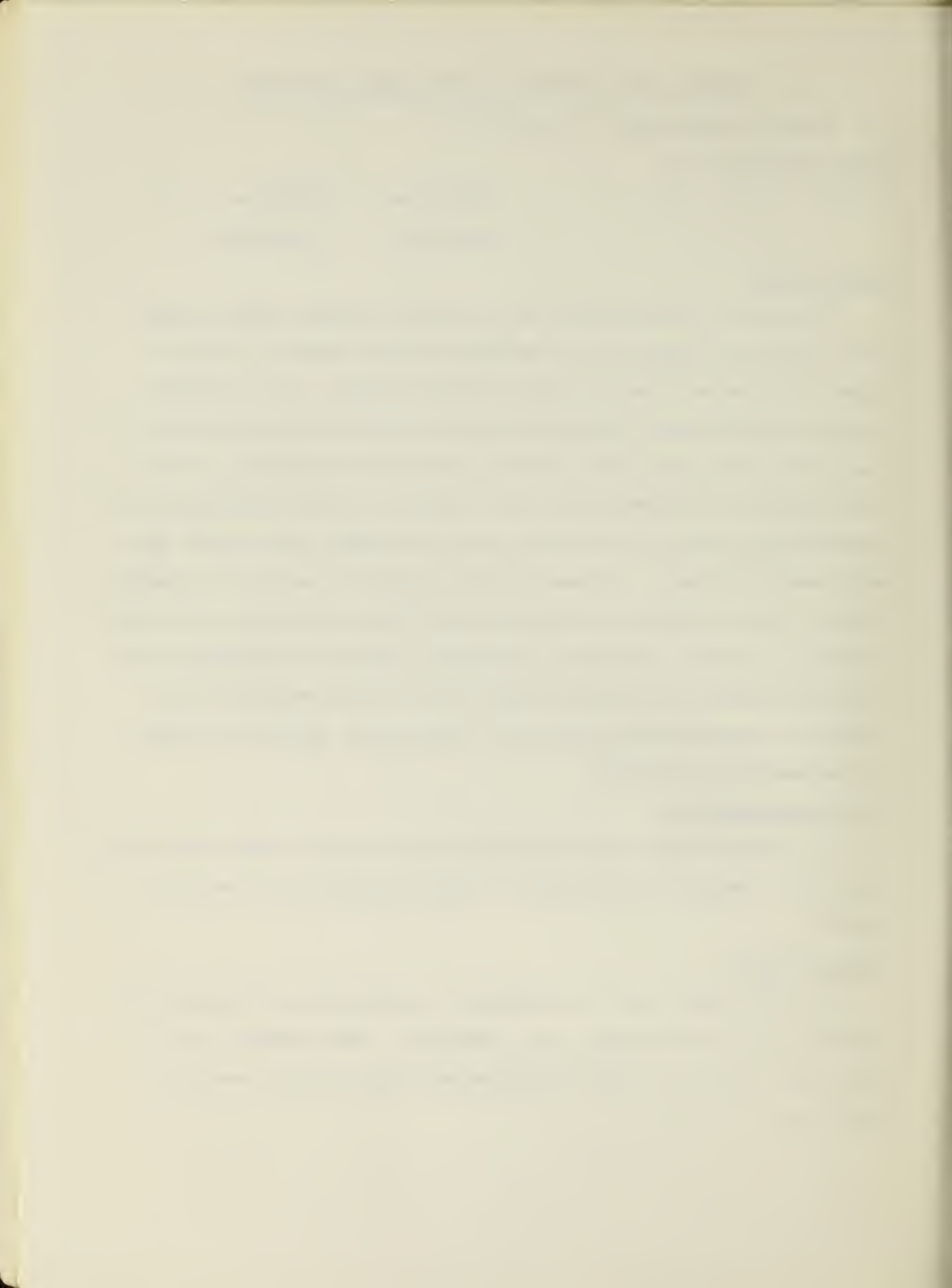
The goal of this activity is to monitor highway usage through the collection of data, and to estimate annual travel by various types of trucks and the ton-miles of cargo hauled, and to compare current highway usage characteristics with administrative policies. The results are used at the regional, state and national level for the allocation of highway costs and revenue, in the consideration of transportation policies including size and weight regulations, geometric design criteria, pavement design, and for a variety of special studies. The continuity of the data and trend information since 1963 provides a reliable indicator of changing patterns in highway transportation compared to rail and other modes, and a measure of the effects of transportation policies, regulations, economic activity and technological advances.

1977 Accomplishments

No Vehicle Weight and Characteristics Study was conducted during fiscal 1977 because of the lack of summer personnel and overtime funding.

1978 Objective

The 1978 study will be conducted, if personnel and funding are available, at the following four locations: North Adams, Route 8; Longmeadow, Route I-91; West Bridgewater, Route 24; and Swansea, Route I-95.



This study will provide a variety of information including:

- o Station data including location, scale type, personnel, and roadway and pavement characteristics.
- o Vehicle type (passenger cars, buses and trucks) in various classifications.
- o Weights and loads by vehicle type.
- o Axle loads and equivalent axle loads for various vehicle classifications.
- o Number of loaded and empty trucks in comparison to other years.
- o Listing of axle loads and axle spacings for various truck classifications.
- o Comparison of Mass. Statutes and AASHTO vehicle recommendations with actual Mass. usage.

<u>Costs (\$)</u>		1977	1977	1978
		Est.	Approx.	Est.
		HPR	Expen.	HPR
a)	Force Account	(1)	(1)	20,000
b)	Contract	<u>0</u>	<u>0</u>	<u>0</u>
	TOTAL	0	0	20,000

(1) No Vehicle Weight Study was conducted in 1977.



2-0 HIGHWAY DATA COLLECTION AND PLANNING SERVICES

2-7 Defense Bridges and Critical Highway Facilities Record (formerly 2-3)

Staff Responsibility

Inventory and Statistics Unit: Supervisor, K. Wilman
 Manager, E. Seed

Project Goal

The goal is to prepare the Bridge Index Map and Mileage Summary Table required by FHPM 6-10-2. This effort is in support of the MDPW Highway Maintenance Division, which will be responsible for maintaining and updating this record starting in 1978.

This information is necessary for the safe routing of oversize or overweight vehicles, and for the movement of freight and equipment in an emergency.

1977 Accomplishments

The Highway Bridge Defense Record was updated from 1972 to 1975 and computerized, using a new format.

1978 Objectives

After 1977, maintaining and updating this record will be the responsibility of the MDPW Highway Maintenance Division; BTP&D will provide the Bridge Index Map and Mileage Summary Table in support of that effort.

<u>Cost (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	2,000	2,800	5,000
b) Contract	0	0	0
Total	<u>2,000</u>	<u>2,800</u>	<u>5,000</u>

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-1 Census Data Development

(formerly 3-3)

Staff Responsibility

Data Services Unit: Supervisor: J. D'Angelo
 Manager: W. Harward

Project Goal

The project goal is to collect and utilize Census-generated data through information systems development and technical assistance provided to various federal, state and local agencies, Regional Planning Agencies, organizations, businesses and educational institutions, and to foster development of coincident Census and Analysis Zone boundaries to ensure optimum utilization of the data.

BTP&D has been designated by the Governor as the official statewide contact agency for the U. S. Bureau of the Census.

1977 Accomplishments

Accomplishments for the year include:

- o Continued processing and dissemination of 1970 Census data, especially Journey-to-Work Information, in a variety of formats for the different agencies using this data.
- o Monitoring participation of the RPA's in all ten Standard Metropolitan Statistical Areas for the Correction, Update and Extension (CUE) program, funded through the Federal Joint Statistical Agreement.
- o Liaison and statewide coordination of all 1980 Census Tract Committees and RPA's has resulted in expanded tracts, and enlarged potential data collection through the use of updated maps and functional highway networks.
- o The Census Journey-to-Work trip tables were updated.

- o The MEDLIST program equivalency tables now enable use of Census data and programs for any combination of regions, counties, cities, towns or analysis zones in the state.

1978 Objectives

The technical assistance and appropriate ongoing computer services outlined above will continue to be provided. In addition, existing programs and processes will be geared up for the use of data to be obtained in the 1980 Census.

<u>Costs (\$)</u>		1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a)	Force Account	55,880(1)	50,000(1)	35,000
b)	Contract	<u>0</u>	<u>0</u>	<u>0</u>
	TOTAL	55,880	50,000	35,000

(1) Includes activities that now constitute 1978 HPR Project 3-2.

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-2 Data File Management and Display (formerly 3-3)

Data Services Unit: Supervisor: J. D'Angelo
 Manager: W. G. Harward

Project Goal

The goal of this activity is to maintain and improve the existing computer programs for displaying the Road Inventory, Traffic Volume, Bridge Inventory and various other data files, including the Office of State Planning (OSP) demographic file, to develop new systems for processing data, and to incorporate all existing and proposed data files into a single information system; this will allow retrieval of all file data in a variety of formats that will eliminate the hand processing currently required for certain purposes, such as the NHIPS study under 2-4.

1977 Accomplishments

During 1977:

- o The Traffic Volume and other inventory files were updated.
- o Development continued on improved data display techniques.
- o An interim plot program was developed to display the statewide network for editing.
- o Technical assistance was furnished to BTP&D units, and state and regional agencies for both direct and remote terminal computer processing.
- o An EMPIRIC file was developed for OSP population and housing projection data.

1978 Objectives

The appropriate ongoing computer services outlined above will be continued, and work will proceed on developing a system for displaying the OSP data now being received.



The various data files are being coordinated for inclusion into a single comprehensive data system.

The 1977 Road Inventory statistics will be forwarded to FHWA in Mileage Facilities reporting format.

Computer program PR500 will be rewritten to accurately reflect the PR502 data.

Procedures will be developed for the inclusion of transaction records for BTP&D statistical submissions to the FHWA.

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	(1)	(1)	60,000
b) Contract			
TOTAL	<u>(1)</u>	<u>(1)</u>	<u>60,000</u>

(1) Included in 1977 HPR Project 3-3 (now 3-1).

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-3 Traffic Analysis and Forecasting (formerly 4-7)

Travel Data Unit: Supervisor: J. D'Angelo

Manager: D. Molin

Project Goal

Traffic analysis and forecasting are essential elements in the transportation planning process at the state, regional and local levels. The goal is to provide the means for analyzing corridor planning studies and environmental impact studies and reports, and for forecasting future traffic volumes for state and regional systems, corridors and corridor segments. Output from this process is utilized to resolve transportation issues, evaluate alternatives and determine design needs.

1977 Accomplishments

During 1977, the Travel Data Unit made numerous traffic assignments for proposed highway improvements and developed "no build" assignments for existing routes, as required by various Environmental Impact Statements. Work involved the investigation and detailed evaluation of many highway planning components, including the development of specific traffic forecasts for thirty projects being designed by the Department.

Data and technical assistance on traffic analysis and forecast development were supplied to the CTPS for projects within the Boston Metropolitan Area and to various RPA's for corridor planning studies, and to MDPW consultants.

1978 Objectives

The technical assistance and appropriate ongoing services outlined above will continue to be provided. Specific projects cannot be

identified at this time.

In addition, it is anticipated that the 1979 Interstate Cost Estimate will be compiled during 1978.

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	41,910(1)	36,000(2)	50,000(3)
b) Contract	<u>0</u>	<u>0</u>	<u>0</u>
TOTAL	41,910	36,000	50,000

- (1) Does not include estimated PE charges.
- (2) Does not include PE expenditures of approximately \$13,000.
- (3) Does not include \$15,000 of estimated PE charges.

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-4 Motor Vehicle and Fiscal Data Reporting (formerly 5-1)

Staff Responsibility

Travel Data Unit: Supervisor: J. D'Angelo

Manager: D. Molin

Project Goal

Basic statistical information on motor-vehicle registrations, motor-fuel consumption and highway-user tax revenues collected at the State level is essential for effective highway planning and administration. In addition to meeting the FHWA's reporting requirements, the goal is to compile this data for use in short and long-term highway needs studies, and for the subsequent formulation of transportation programs to meet those needs.

Compiling of the PR-535 Report requires gathering data from each of the State's 351 cities and towns; the data is then aggregated in 43 population and SMSA categories before submission to FHWA.

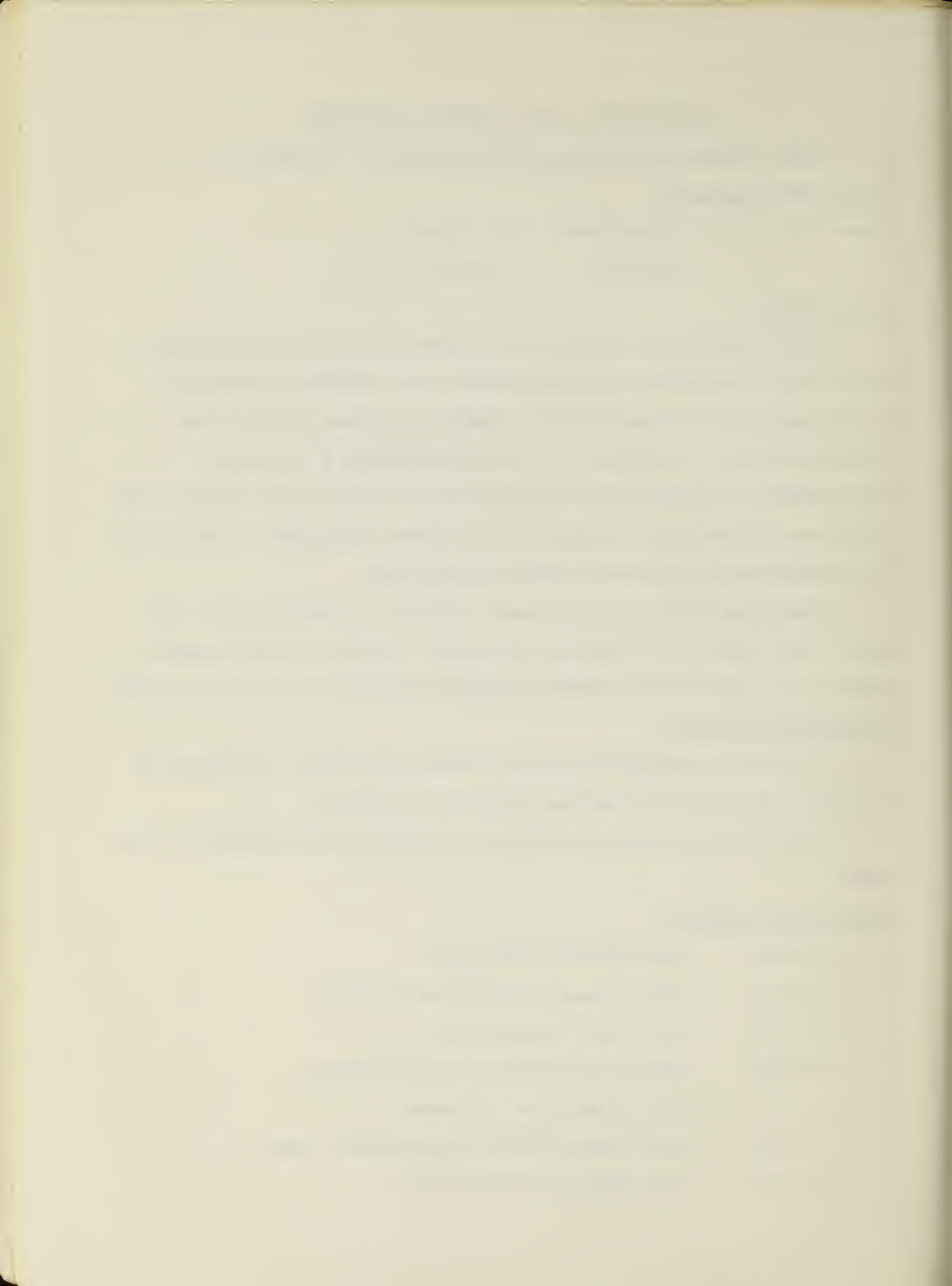
1977 Accomplishments

A file was maintained of all source documents, and copies of all past and current PR Series statistical reports.

The following annual statistical reports were submitted to the FHWA:

Motor Vehicle Series

- o PR-556: State Motor Vehicle Tax
- o PR-571: State Taxes on Vehicles for Hire
- o PR-551: Motor Fuel Consumption
- o PR-561: State Motor Vehicle Registrations
- o PR-562: State Operators' Licenses
- o PR-566: State Motor Vehicle Registration Fees
- o PR-576: State Motor Carrier Taxes



Highway Finance Series

- o PR-530: State Highway Finance
- o PR-531: State Highway Income
- o PR-532: State Highway Expenditure
- o PR-532A: Capital Outlay
- o PR-532B: Expenditure by SMSA
- o PR-535: Local Road Finance Reports
- o PR-541: New Bond Issue
- o PR-542: Highway Debt Status
- o PR-543: Bond and Interest Transacting
- o PR-544: Future Debt Estimate

Information was supplied, upon request, to various agencies and communities during the year.

1978 Objectives

This unit will canvas all communities in the state to compile the PR-535 Local Road Finance Report, and coordinate the update of the other PR Series Reports for submission to the FHWA.

<u>Costs \$</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Cost Account	34,925	30,000	50,000 (1)
b) Contract	<u>0</u>	<u>0</u>	<u>0</u>
	34,925	30,000	50,000

- (1) Increase in estimated cost is due to assignment of an additional employee to this activity to ensure timely submission of reports to FHWA.

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-5 Regional Data and Modelling Assistance (formerly 8-14)

Staff Responsibility

Systems Development Unit: Supervisor: J. D'Angelo

Manager: C. S. Young III

Project Goal

This project provides technical assistance and training to each RPA for the development and use of regional transportation demand estimation models. This capability will enable each RPA to conduct effective analyses of existing transportation facilities and future projects and proposals.

Data for regional transportation model development is obtained from the regions, other BTP&D units, and various other agencies.

1977 Accomplishments

Eight RPA's are now capable of utilizing the MDPW's Boston-based computer through the District Computer Terminal Network.

Data accumulation is continuing under various HPR projects and the RPA/DPW unified work programs. Analysis zones for all Regions have been defined.

Four RPA's have begun validation of a 1975 base year model; the Metropolitan Boston Region model was completed under a contract with A. M. Voorhees which also benefited the Northern Middlesex, Merrimack Valley and Old Colony regions.

Technical assistance, analyses, training, project reviews, and various other services were provided during the year in support of the project goals.

1978 Objectives

The technical assistance, training, and appropriate ongoing

data services outlined above will continue to be provided to the RPA's.

Base year (1975) transportation demand estimation models will be completed in all RPA's except Martha's Vineyard and Nantucket.

A significant increase in the level of effort applied to this activity appears to be necessary, since all RPA's fell far short of anticipated 1977 objectives. As a means of attaining 1978 objectives, additional technical support will be provided to the RPA's by a consultant, to augment the technical assistance and training provided by BTP&D. The consultant contract will be PL funded under HPR 4-0. These consultant services will be terminated when transportation demand analysis procedures are operational in all subject RPA's. BTP&D personnel will also benefit through participation and observation in the support activities provided by the consultant which should minimize our future need for such services.

1978 Objectives

The 1978 objective is to provide the following products; the agency with prime responsibility is indicated in parenthesis:

- o Centroid location and centroid connectors for RTZ (RPA)
- o Land use and socioeconomic data by RTZ (RPA)
- o Requested traffic counts (BTP&D)
- o Regional traffic flow maps (RPA)
- o Coding for links of regional significance (RPA)
- o Regionalized highway network (BTP&D)
- o Transit system data, etc. (RPA)
- o Regional trip generation (RPA)
- o Regional total vehicle trip tables (BTP&D)

- o Regional assignments (BTP&D)
- o Review and Analysis Reports (Joint)

<u>Costs (\$)</u>	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account	25,000	26,000	50,000 (1)
b) Contract	<u>0</u>	<u>0</u>	<u>(2)</u>
Total	25,000	26,000	50,000

- (1) Increased 1978 estimate is due to additional personnel assigned to this activity.
- (2) Funding of approximately \$100,000 for this contract is included in the PL funding for 4-0.

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-6 Statewide Modelling and Planning Applications (formerly 7-4)

Staff Responsibility

Systems Development Unit: Supervisor: J. D'Angelo

Manager: C. S. Young III

Project Goal

The project goal is to accumulate and process transportation related data from a variety of sources and to develop a statewide transportation demand analysis procedure, including a computer-based network and model. Computer analysis procedures for statewide comprehensive planning activities will be implemented and refined.

This project is intended to provide coordination and direction for regional modelling efforts under 3-5, and input to the development of the statewide comprehensive transportation plan under 5-2.

1977 Accomplishments

Technical assistance, analyses, and computer services were supplied to various MDPW units and to other agencies.

Various new analytical techniques have been investigated and implemented where feasible.

Initial coding and edits of link presence and node coordinate information have been completed for the statewide highway network. The link data and network logic edits are underway.

1978 Objectives

The technical assistance, analyses, and appropriate ongoing computer services outlined above will continue to be provided.

The statewide transportation demand analysis model will be applied to the entire state on a town basis. The model will contain those elements listed as products below. The result will be a highway vehicle assignment for 1975 on the higher functionally classi-

fied roads throughout the state (classes 1, 2, 3, & 4, most likely).

Information and coordination will continue to be provided to the RPA's to ensure compatibility between products of the RPS's and BTP&D. Data for the products below were provided by a variety of sources.

Anticipated 1978 products include:

- o Statewide highway network
- o Town centroid locations and centroid connectors.
- o State land use and socio-economic data file.
- o State traffic flow map.
- o Internal and external total vehicle trip tables.
- o Internal town total person trip ends.
- o Total person internal trip tables by town by purpose (3 est.)
- o Auto person-percent and occupancy matrices.
- o Internal truck and other non-person trips.
- o Journey-to-Work assignment.
- o Highway accessibility data.
- o Network data plots.
- o Minimum impedance plots
- o I-X, X-I total vehicle table.
- o Statewide Traffic assignment.
- o Statewide V/Count and V/Capacity plots

<u>Costs (\$)</u>		1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a)	Force Account	160,000	160,000	135,000
b)	Contract	<u>0</u>	<u>0</u>	<u>0</u>
		160,000	160,000	135,000

3-0 - DATA ANALYSIS AND COMPUTER SERVICES

3-7 Eastern Massachusetts Area Transportation Studies (formerly 8-15)

Staff Responsibility

Systems Development Unit: Supervisor, J. D'Angelo

Manager, C. Young III

Project Objective

The objective is to develop operational models and networks by updating and refining products of recent planning studies in the Eastern Massachusetts Area:

- o Boston Transportation Planning Review (BTPR): Transit network data.
- o PMM Model validation study: Networks, zones
- o CTPS/MBTA: Transit Data development
- o MAPC/Area RPA's: Socio-economic data, etc.

1977 Accomplishments

The AMV Contract for the Eastern Mass. Regional Planning Project (EMRPP) has been completed with preparation of a 1975 simulation with a check against 1975 traffic flows. The contract product includes one set of results for each RPA in the study area. In addition, a new Modal Split Model was designed to meet the requirements of the CTPS. Use of the contract products has begun in each of the subject RPA's.

1978 Objectives

The objective is to implement the contract recommendations, where feasible.

The applicable base data and contract results will be utilized by each RPA within the EMRPP area to improve planning methodology

and modelling processes for both the RPA's and BTP&D.

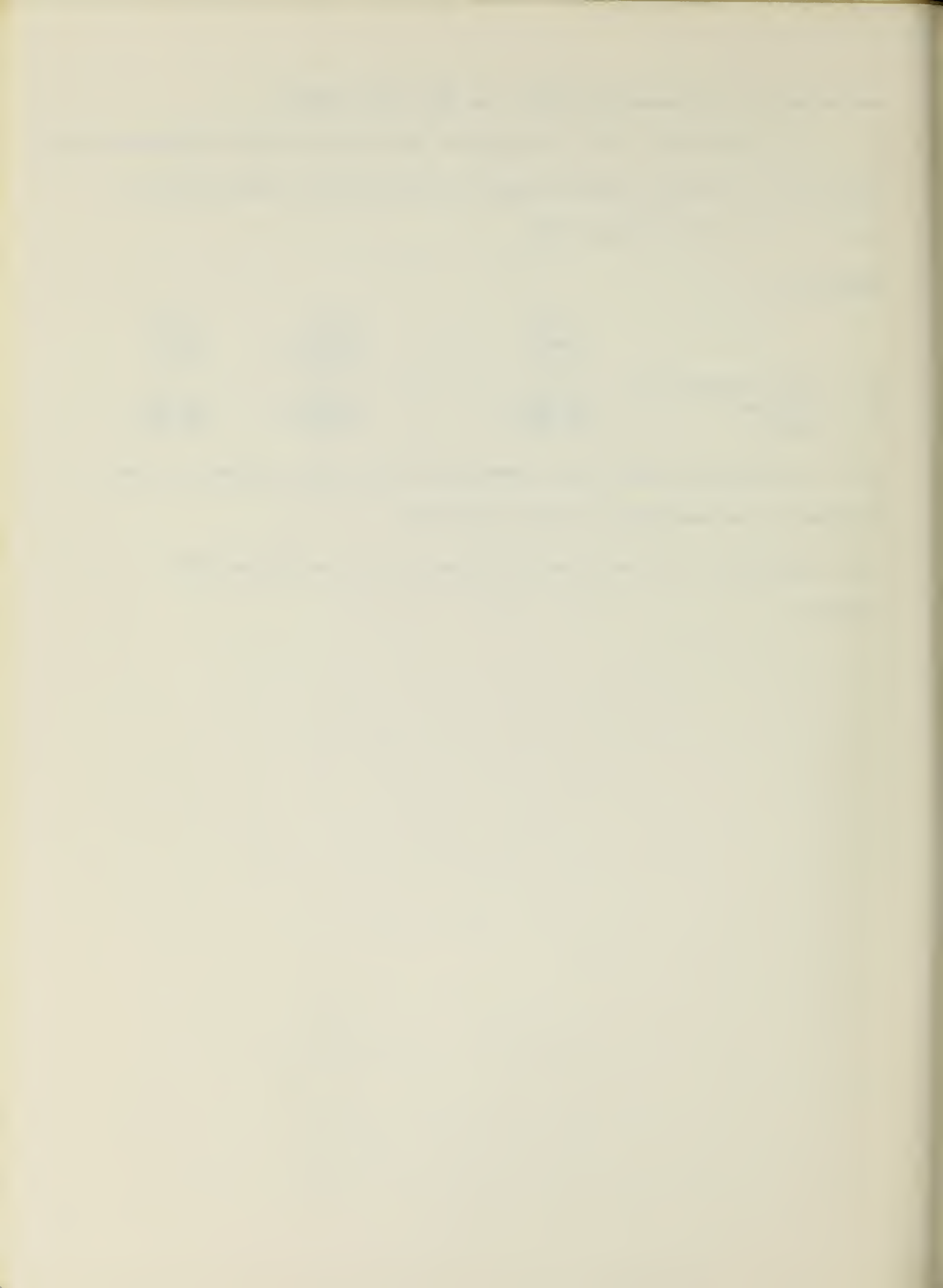
It is anticipated that the Eastern Massachusetts Area Transportation Study and the Boston Transportation Planning Review contracts will both be closed out during 1978.

Costs \$

	1977 Est. HPR	1977 Approx. Expen.	1977 Est. HPR
a) Force Account (1)	0	0	0
b) Contract	<u>75,000</u>	<u>1,000 (2)</u>	<u>75,000</u>
Total:	75,000	1,000	75,000

(1) Any BTP&D personnel costs associated with this project will be charged to the employee's regular activity.

(2) Additional costs have been incurred, but have not yet been billed.



4-0 - REGIONAL TRANSPORTATION PLANNING LIAISON ACTIVITIES (formerly 8-0)

Regions

- | | |
|----------------------------|---------------------------|
| 4 - 1 Berkshire | 4 - 7 Merrimack Valley |
| 4 - 2 Franklin | 4 - 8 Metropolitan Boston |
| 4 - 3 Lower Pioneer Valley | 4 - 9 Old Colony |
| 4 - 4 Montachusett | 4 - 10 Southeastern Mass. |
| 4 - 5 Central Mass. | 4 - 11 Cape Cod |
| 4 - 6 Northern Middlesex | 4 - 12 Martha's Vineyard |
| 4 - 13 Nantucket | |

Staff Responsibility

3C Liaison Section: Supervisor, G. J. Rourke

Project Goal

The project goal is to provide for the development of regional multi-modal transportation plans and programs by the Regional Planning Agencies (RPA's) through a comprehensive cooperative and continuing (3C) transportation planning process, in accordance with Federal rules and regulations. This process involves a variety of agencies and disciplines to ensure that transportation plans and programs are consistent with the comprehensive development plans of the regions.

1977 Accomplishments

During 1977, major work efforts in each region were directed towards carrying out the planning activities necessary for federal certification of the ongoing "3C" transportation planning process, and each urbanized region in the Commonwealth received certification by the Federal Highway and Urban Mass. Transportation Administrations.

The use of standard unified work program and lump-sum contract formats has minimized red tape and achieved greater administrative

efficiency, and more consistency and compatibility among the regional planning processes.

Procedures were developed for conducting A-95 reviews, and made a part of the Prospectus required for each region by Federal regulations.

The Regionwide Comprehensive Transportation Planning Studies underway in the Berkshire and Montachusett regions progressed during the year.

Technical assistance and continual liaison were provided to the regions throughout the year to improve the technical capabilities of RPA personnel and to aid the RPA's in carrying out the "3C" transportation planning process.

During 1977, BTP&D took over operations of the Ridesharing Program that was initiated under a consultant contract as "Masspool" in 1975. Planning personnel contacted employers throughout the state to promote the formation of employee carpools and vanpools. This program is primarily funded by the Federal Energy Administration.

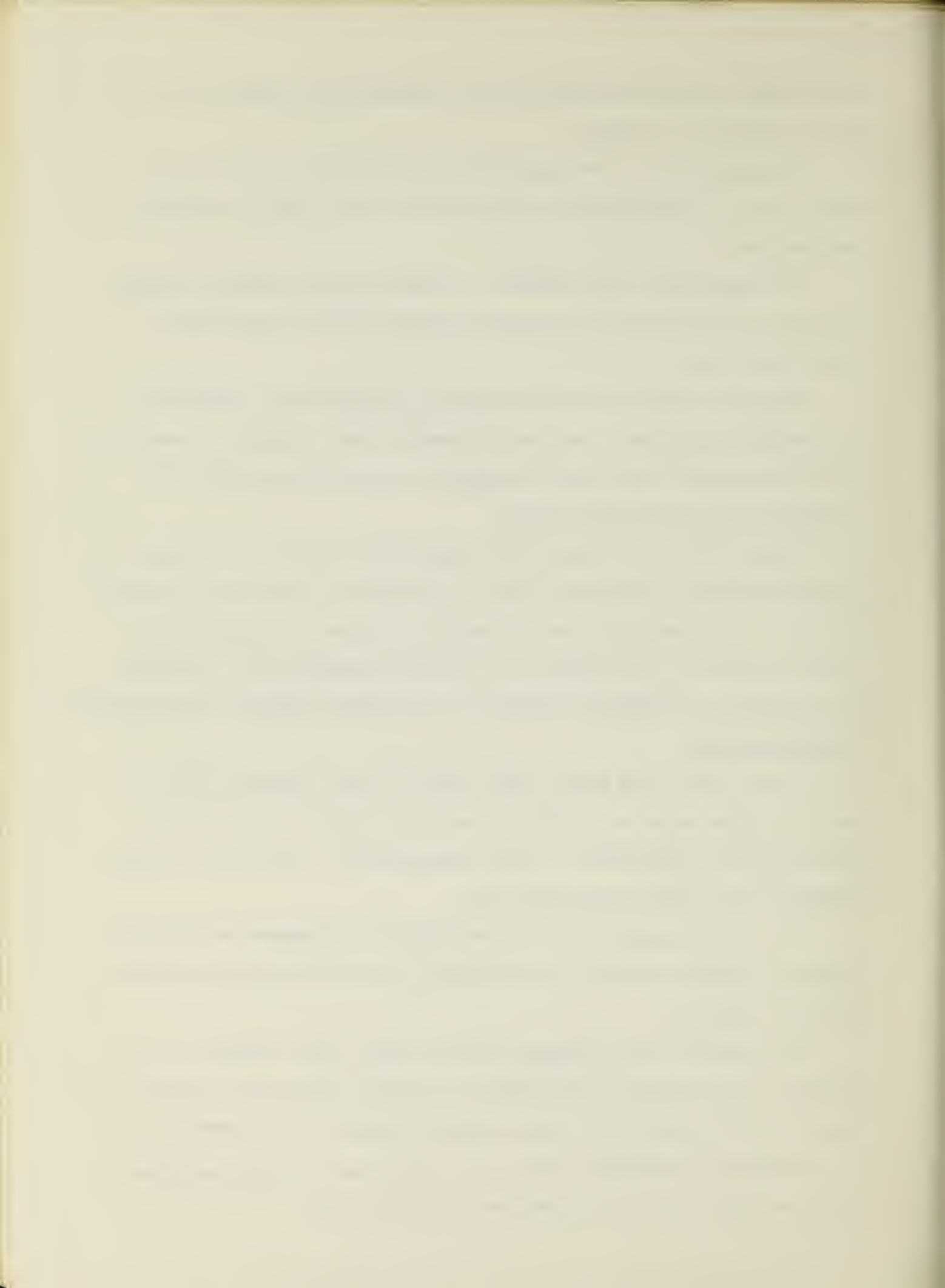
1978 Objectives

During 1978, the major work effort in each region will be to carry out the tasks set forth in the RPA's Unified Work Program, including the development of the transportation plans and programs required for federal certification.

It is anticipated that the Regionwide Comprehensive Transportation Planning Studies in the Berkshire and Montachusett regions will be completed.

The Unified Work Programs for the RPA's will continue to be modified and refined as necessary to clarify roles and responsibilities and to achieve a more product-oriented "3C" process.

Technical assistance and other appropriate ongoing services outlined previously will continue to be provided.



A consultant contract to provide additional technical support for the traffic modelling activities in the regions will be provided under HPR Project 3-5 and funded under the PL allocation.

The RPA's will take on added responsibilities for the statewide Ridesharing program, and will be increasingly relied on for data support and technical field assistance for both employer contact and continued program maintenance.

The RPA's are also expected to become more familiar with the Vanpool program in order to reach the local population at the community level.

Specific products of the "3C" process will include:

- o Updated Unified Work Programs
- o Prospecti (Operation Plans)
- o Transportation Plans (including a Transportation Systems Management Element)
- o Transportation Improvement Plans (including an annual element).

RPA FUNDING AND 3C LIAISON COSTS (\$)

Region	77 HPR			77 PL RPA	77 Total	78 HPR			78 PL			78 Total
	Force Acct.	RPA	Total			Force Acct.	RPA	Total	DPW	RPA	Total	
Berk. 8-1	30,000	-	30,000	50,000	80,000	34,500	-	34,500	21,000	45,000	66,000	100,500
Frank. 8-2	23,000	35,000	58,000	-	58,000	23,900	35,000	58,900	-	-	-	58,900
LPV 8-3	25,000	-	25,000	110,000	135,000	30,600	-	30,600	25,000	122,000	147,000	177,600
MRPC 8-4	34,000	-	34,000	130,000	164,000	22,000	-	22,000	17,000	80,000	97,000	119,000
CMRPC 8-5	24,000	-	24,000	90,000	114,000	22,000	-	22,000	20,000	130,500	150,500	172,500
NMAC 8-6	19,000	-	19,000	85,000	104,000	30,500	-	30,500	14,000	84,000	98,000	128,500
MVPC 8-7	25,000	-	25,000	66,000	91,000	27,400	-	27,400	14,000	75,000	89,000	116,400
MAPC 8-8	40,000	-	40,000	610,000	650,000	40,500	-	40,500	93,000	520,000	613,000	653,500
OCPC 8-9	19,000	-	19,000	125,000	144,000	20,400	-	20,400	14,000	75,000	89,000	109,400
SRPEDD 8-10	25,000	-	25,000	130,000	155,000	33,300	-	33,300	23,000	104,000	127,000	160,300
CAPE 8-11	10,000	35,000	45,000	-	45,000	17,100	35,000	52,100	-	-	-	52,100
MVC 8-12	1,000	-	1,000	-	1,000	3,500	-	3,500	-	-	-	3,500
NANT. 8-13	4,000	10,000	14,000	-	14,000	5,400	12,000	17,400	-	-	-	17,400
TOTAL	279,000	80,000	359,000	1,396,000	1,755,000	311,100	82,000	393,100	241,000	1,235,500	1,476,500	1,869,600

4-0 - REGIONAL TRANSPORTATION PLANNING

4 -14 Berkshire County Regional Planning Study (formerly 8-1A)

Staff Responsibility

Project Manager: P. Mahoney, DPW District I Planning Engineer

BTP&D Support Activities: Policy Committee, G. Thomson

"3C" Liaison, P. Chapman

Technical Coordinator & Monitor, D. Luce

Systems Development Assistance, C. Young

Comprehensive Planning Activities, T. Vigil

Project Goal

The goal is to supplement and complement the Planning Activities of the Berkshire County Regional Planning Commission by conducting a Regional Planning Study to integrate transportation planning with future land use, and growth and development policies of the region.

A consultant contract was awarded in 1976 for the preparation of a multi-modal transportation plan consistent with the Comprehensive Regional Planning Study for Berkshire County.

1977 Accomplishments

The major work effort was the data collection and analysis as detailed in the approved study design.

Products include:

- o Lee Corridor Planning Study Report
- o Route 8 Corridor Planning Study Report (Pittsfield to N. Adams)
- o Inventory of existing data.
- o Regional Growth Plan
- o Valuation Mechanism Report
- o Alternative strategies for future growth and development.

The BTP&D has provided policy direction and technical assistance for the study effort.

1978 Objective

The objective for 1978 is to continue to develop and document regional growth and development policies: evaluate existing conditions, make projections, and analyze alternatives.

The anticipated product is the completed Regional Transportation Plan.

<u>Costs (\$)</u> (1)	1977 Est. PL	1977 Approx. Expen.	1978 Est. PL
a) Force Account	0	0	0
b) Contract	<u>150,000</u>	<u>100,000</u> (2)	<u>136,000</u>
Total	150,000	100,000	136,000

(1) BTP&D personnel associated with this project are charged to their regular activity.

(2) This is a two year contract, and charges billed during 1977 were less than anticipated.

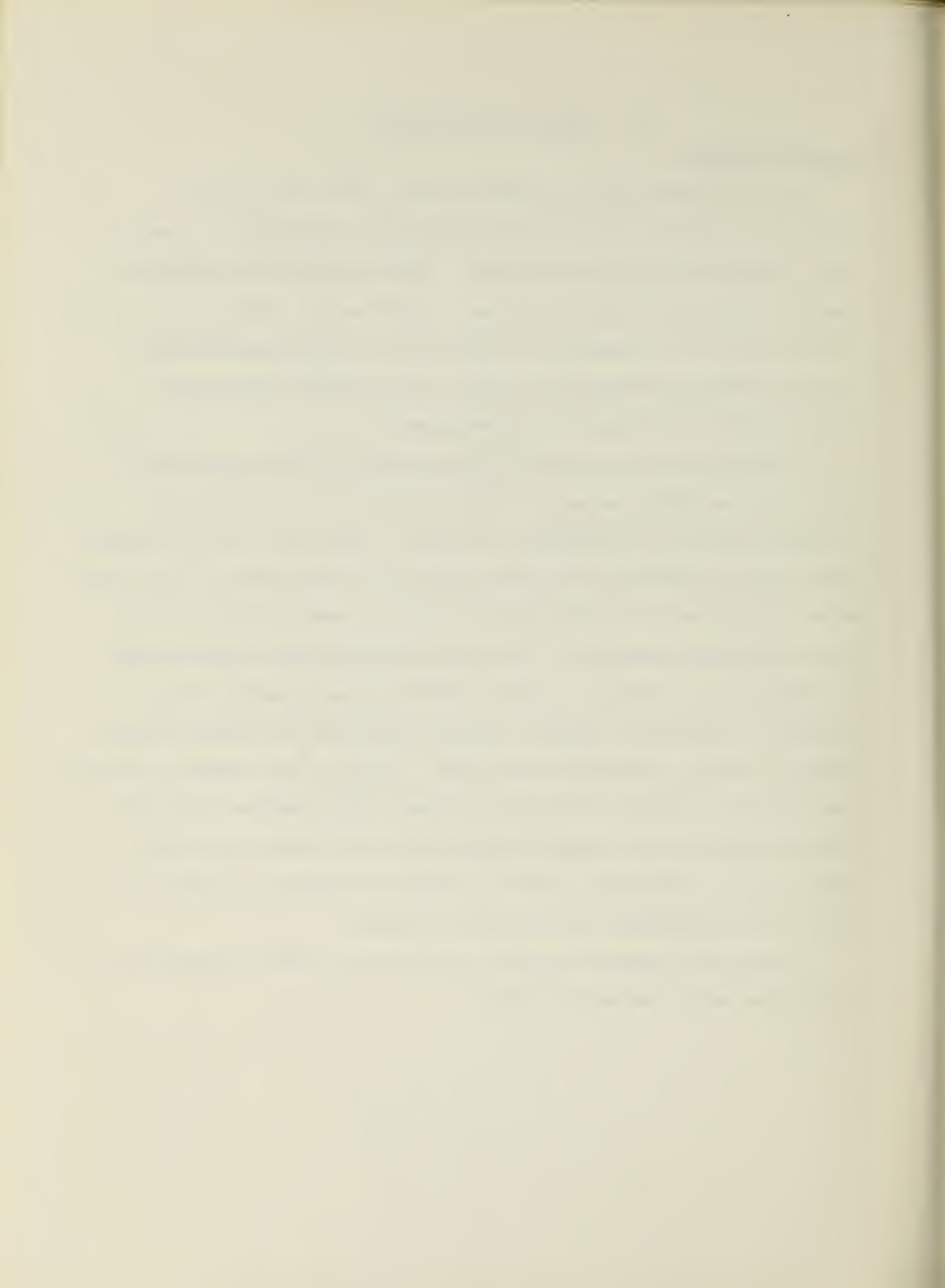
5-0 - PROGRAM DEVELOPMENT

General Overview

At the present time in Massachusetts there are several functional planning programs that are being undertaken by numerous local, regional and state agencies. These programs are funded by numerous state and federal sources, including not only the U.S. D.O.T. but also the U. S. Department of Housing and Urban Development, the Environmental Protection Agency, the Economic Development Administration and Coastal Zone Management.

Transportation plans must be developed in full coordination with land use plans, water and sewer plans, housing plans, and economic growth and development programs. They must also be consistent with environmental and energy goals and objectives. One of the major objectives of the Program Development Section is to insure that appropriate mechanisms exist for achieving that coordination. In addition, the Section insures that full use is made of the programs in assisting Regional Planning Agencies to develop comprehensive regional transportation plans. Finally, the Section utilizes the planning products developed by other state agencies, Regional Planning Agencies and various MDPW units as the basic input for compiling and assembling various statewide planning documents for use in the development of statewide programs.

Program Development Section activities for 1978 are described in greater detail under 5-1 and 5-2.



5-1 Transportation Planning Coordination (formerly 11-14 with elements of 7-5 and 7-6)

Goals

1. Coordination with local, regional, state and federal agencies, on the preparation of interagency agreements, technical guidelines and procedures and review of plans and programs, concerning water quality, coastal zone management, air quality, rural development, energy, and the comprehensive planning assistance program.

2. Coordination with other state transportation programs including the continuing airport systems planning program, statewide rail plan, water transportation plans and programs, Massachusetts Bay Transit Authority and other regional transit authority Plans and Programs, and Rural Highway Public Transportation Demonstration Programs.

3. Opportunities for Inter-program discussions and continued training and professional development of Bureau of Transportation Planning and Development personnel to handle all their responsibilities, including: training (Conferences, courses and meetings) and communication with American Association of State Highway and Transportation Officials, the Transportation Research Board, other professional organizations, and other states.

1977 Accomplishments

1. Negotiated a memorandum of understanding specifying the arrangements between the Department of Public Works and Environmental Quality Engineering for the maintenance of air quality standards through transportation plans and programs.

2. Completed assistance to Executive Office of Transportation and Construction in a study identifying and evaluating potential uses for abandoned Railroad Rights of Way.

3. Conducted investigations, evaluations and formal public hearings on 20 requests for construction permits on railroad rights of way.

4. Coordinated the determination of Department interest on 64 Railroad rights of way parcels put up for sale as part of the Commonwealth's "right of first refusal" on any rights of way property for sale.

5. Monitored contracts on the Rural Highway Public Transportation Demonstration Program with:

- a. Franklin County which is into the sixteenth month of a two year program.
- b. Barnstable County in the eleventh month of the two year program.

6. Coordinated Departmental relations with outside agencies, (other states, professional organizations, Federal Highway Administration, etc.) for training, conferences and seminars and for the interchange of planning information.

7. Reviewed and assisted in the development of the study design for the Continuing Airport System Plan and maintained communications with the Massachusetts Aeronautics Commission on the conduct of the study.

8. Maintained coordination with other state planning agencies concerning water quality, air quality, coastal zone management, land-use, etc. through meetings, plan reviews and the federal A-95 review process.

9. Participated in regional agency meeting deliberations for input of transportation concerns.

10. Reviewed and commented on appropriate legislation.

1978 Objectives

1. Continue ongoing railroad programs on requests for construction permits on rail rights of way and on the sale of railroad rights of way parcels.

2. Continue monitoring contracts on the Rural Highway Public Transportation Demonstration Program, completing activity in Franklin County and achieving approximately 95% completion in Barnstable County.

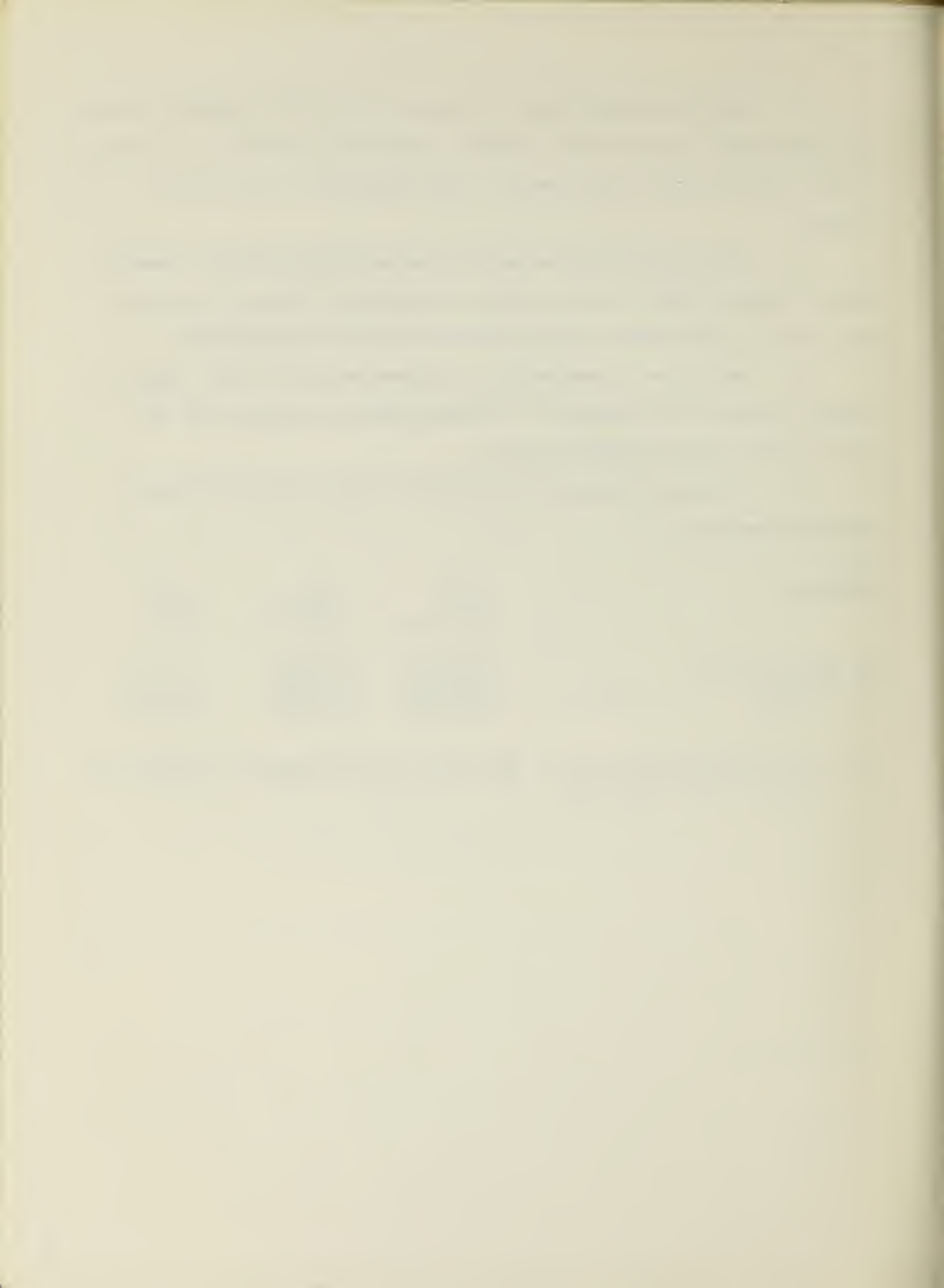
3. Develop procedures for the implementation of the memorandum of understanding on air quality maintenance between this Department and the Department of Environmental Quality Engineering.

4. Negotiate a memorandum of understanding for the input of energy conservation measures in transportation planning with the State Energy Policy Administration.

5. Continue program of coordination with other functional planning agencies.

<u>Costs \$</u>	1977 Est. HPR (1)	1977 Approx. Expen. (1)	1978 Est. HPR
a) Force Account	136,865	136,000	30,000
b) Contract	<u>36,000</u>	<u>36,000</u>	<u>0</u>
Total	172,865	172,000	30,000

(1) Includes 1977 7-5, 6, 7 and 11-14, some elements of which are now part of 1978 5-2.



5-0 PROGRAM DEVELOPMENT

5-2 Regional and Statewide Transportation Plan Development
(formerly 7-7 with elements of 7-5 and 7-6)

Goals

1. Assist the regional planning agencies in the development of Corridor Planning Studies.
2. Assist the Berkshire and Montachusett regions with the development of region-wide Transportation Plans.
3. Assist other regional planning agencies in compiling and assembling the material necessary for the development of a comprehensive regional transportation plan.
4. Compile and assemble material (prepared in some cases by other federally funded planning programs) needed to develop a state-wide transportation plan.

1977 Accomplishments

1. Monitored and provided guidance on comprehensive regional transportation plans in:
 - a. Berkshire County which is 60% completed.
 - b. Montachusett Region which is 75% completed.
2. Developed and distributed guidelines for the implementation of bikeway projects to be financed from the 1977 State Bond Issue.
3. Updated the State Bikeway Plan and established a statewide bikeway program.
4. Completed the study design for development of the state-wide comprehensive transportation plan.
5. Completed the updated corridor planning study guidelines.
6. Disseminated 4 quarterly corridor planning study status reports.
7. Monitored the completion of nine corridor planning studies

and worked with the regional planning agencies on twenty-three more corridor planning studies.

1978 Objectives

1. Complete the Guidelines for the Regional Transportation plans.
2. Completion of the Berkshire County Regional Transportation Plan.
3. Completion of the Montachusett Regional Transportation Plan.
4. Provide technical assistance to the Regional Planning Agencies on special studies (for example the I-495 Growth Study).
5. Continue issuance of the quarterly corridor planning study status reports.
6. Assist the Regional Planning Agencies in completing the ten to fifteen more corridor planning studies.
7. Assist all the Regional Planning agencies in the annual update of their transportation plans (both long range and transportation systems management elements).
8. Compile and review relevant plans from other agencies for input to the statewide comprehensive transportation plan.
9. Develop draft of the Interim Statewide Comprehensive Transportation Plan.
10. Update statewide and regional bikeway plans and programs.

<u>Costs</u>	\$	1977 Est. HPR	1977 Approx. Expen.	1978 Est. HPR
a) Force Account		(1)	(1)	88,000
b) Contract		<u>0</u>	<u>0</u>	<u>0</u>
TOTAL		<u> </u>	<u> </u>	<u>88,000</u>

(1) Costs associated with 1977 HPR Projects 7-5, 6, 7 and 11-14 are shown under 1978 5-1.

Staff Responsibility

Capital Expenditure and Program Office (CEPO)

Director: G. Joseph

Administrator: T. Richardson

Project Goal

The goal is to provide fiscal planning services for both Federal-aid and non-Federal-aid MDPW activities including capital expenditure and project programming.

Federal-Aid activities include processing all submissions and related correspondence for FHWA program and project approvals, maintaining control records for all Federal funds and preparing charts, graphs, etc., to indicate changes in funding levels for the various Federal-Aid categories. An up-to-date set of the Federal-Aid Highway Program Manual, FHWA Notices, and other FHWA publications pertaining to highways is maintained to aid the Department in complying with Federal requirements, and a Transportation Reference Library is maintained for Department use.

CEPO establishes cost accounts for the fiscal control of all MDPW activities, and maintains a project file and schedules the required legal notices for each project advertised for construction.

The computer-based statewide Project Information System developed and maintained by this unit contains data on all active department projects with the exception of maintenance, force account and other small-scale activities. Data on the 1200 MDPW projects included in the system can be aggregated by geographical area (RPA's Districts, municipalities), work type, funding category, project status, project manager, TIP status, and a number of other categories. The computer-

ized data base is utilized for a wide variety of management information and program development purposes within the Department. Printouts distributed to the RPA's provide essential data on local projects to assist them in establishing priorities and developing Transportation Improvement Programs (TIP's) and regional transportation plans.

Project Review Committee agenda are prepared by CEPO, and records are maintained of actions taken to initiate new capital projects.

1977 Accomplishments

All fiscal planning and programming activities outlined above were provided throughout 1977.

Project Information System printouts showing all active capital MDPW projects in their respective areas were provided to RPA and District Offices, and to other MDPW units and state agencies.

Supervision and assistance were provided to the RPA's during their development and updating of the annual Transportation Improvement Programs and various other regional transportation plans required by the FHWA.

The Project Schedule Report containing estimated schedule dates for MDPW projects was expanded in the number of output formats available.

A computerized report format for the weekly Minor Projects Task Force staff meetings was developed and maintained to assist in monitoring the status of individual projects.

The MDPW's annual Two-Year Program of Projects to be Advertised was prepared and distributed.



The Annual Section 105 Program of Projects which lists all proposed program actions for all Federal-Aid MDPW projects to be submitted to FHWA was prepared, submitted and revised as necessary.

Portions of the 1977 Transportation Bond Issue were drafted and submitted, with supporting data, to the Legislature.

1978 Objectives

All appropriate ongoing fiscal planning and programming services previously outlined will continue to be provided. The application and versatility of the Project Information System will be expanded.

<u>Costs (\$)</u> (1)	1977 Est. State	1977 Approx Expen.	1978 Est. State
a) Force Account	140,000	240,000	260,000
b) Contract	0	0	0
Total	<u>140,000</u>	<u>240,000</u>	<u>260,000</u>

(1) This activity is not programmed for Federal participation.

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